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TITLE: Tailoring data and transmission protocol for efficient
interactive data transactions over wide-area networks

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Detailed Description Text - DETX (4):

In this embodiment hand-held computer 13 is a high-end personal organizer, such as a Sharp Wizard.TM. personal organizer. The hand-held computer, however, can be any one of a large number of commercially available computing devices with a broad range of capabilities, including those devices known as personal digital assistants (PDAs). In other embodiments and aspects of the present invention, the computer used by a person to access and interact with the Proxy-Server in practicing the present invention need not be a hand-held, or even a portable computer in the sense the terms are used in the art. In some aspects, capabilities of a field unit according to the present invention are built into a set-top box for a TV system or directly into a TV set.

Detailed Description Text - DETX (17):

Proxy-Server 19, instead of displaying the downloaded data (or playing video and/or audio output, as the case may be, depending on the downloaded data), translates the data to a simpler communication protocol and sends the data to computer 13 for output over link 15 in a TCP/IP protocol. Link 15 becomes a dedicated TCP/IP pipe to and from Proxy-Server 19. Proxy-Server 19 thus acts as a proxy for computer 13, performing those functions of WEB browsing computer 13 cannot perform.

Detailed Description Text - DETX (20):

One of the processing tasks that has to conventionally occur at the browser's computer is processing of received data into a format to be displayed on whatever display the user has. There are, as is well-known in the art, many types of displays and many display modes. These range all the way from relatively crude LCD displays to high-resolution, multi-color displays. There are, in addition, a number of other functions that have to be performed conventionally at a user's computer to interact effectively with the WWW. For example, audio and video and some other functions typically require

supplemental, or helper, applications to be installed on or downloaded to a field unit to process audio and video data and the like.

Detailed Description Text - DETX (21):

Most data transferred by WEB servers assumes relatively high-end displays, such as color SVGA displays as known in the art. In PDAs and digital organizers, such as those anticipated for use in the present invention, the displays are relatively low resolution, and are typically LCD in nature. In the system described with the aid of FIGS. 1 and 2 InterBrowser program 45 at the Proxy-Server and the HT-Lite NanoBrowser program at the hand-held unit cooperate in another manner as well. When one connects to the Proxy-Server the hand-held unit, through the HT-Lite NanoBrowser program, provides a signature which the Proxy-Server compares with logged signatures.

Detailed Description Text - DETX (24):

There are many functions other than simple WEB browsing that are desirable for a hand-held devices like those contemplated to be used with systems according to embodiments of the present invention. The typical functions for digital organizers and PDAs, for example, such as scheduling of appointments, listing phone numbers, addresses and the like, taking notes, sending faxes and E-mail and so forth, and such tasks as currency conversion, are still provided by a hand-held unit executing HT-Lite. Now, however, these functions are more interactive than previously, as data for these functions can be exchanged through the TCP/IP link with the Proxy-Server, which may access data from a variety of sources to update data for such functions.

Detailed Description Text - DETX (26):

To practice the invention, given an accessible WEB server configured as a Proxy-Server according to an embodiment of the present invention, one needs only to load HT-Lite NanoBrowser software on a computer and to provide Internet access for the computer, such as by a telephone modem. In many cases, candidate computers have built-in modems. In other cases, an external modem may be provided and connected. In the case of hand-held devices, such as PDAs and organizers, some have an ability to load software via a serial port, a PC card slot, through the modem extant or provided, or by other conventional means. IN some cases, all operating code is embedded, that is; recorded in read-only memory. In some of these cases, adding HT-Lite routines may require a hardware replacement. In virtually all cases of hand-held devices, however, the necessary routines can be provided.

Detailed Description Text - DETX (43):

At step 101 the Proxy-Server converts all of the jpg files to a dithered bitmap format according to information associated with the user ID received from the hand-held at log-on. This ID establishes the size and resolution of the hand-held's display, for example, and the bitmap created from the jpg files is scaled to the hand-held's display.

Detailed Description Text - DETX (64):

In FIG. 6 events for purposes of description begin at step 119. Modified SendMail is active. At step 121 incoming mail is received. In this modified system, there are three file systems 123, 125, and 127 for storing E-mail in different versions. At step 129 a text copy is saved in file system 123 according to Post Office Protocol, revision 3 (POP-30 format, known in the art. At step 131 a copy of the received E-mail entity is saved in HTML format, for WEB mail. At step 133 a copy of the entity is saved in HTL format, compatible with the communication protocol for HT-Lite used between a field unit and a Proxy-Server in embodiments of the present invention.

Detailed Description Text - DETX (147):

Templates for non-screen appliances are especially interesting. Such templates may specify subsets of pages for transmission. As an example, in the case of a PC peripheral doll, one may access a weather forecasting page, and a template may be provided that will result in the doll doing a hula dance if the weather will be warm, and shivering if the forecast is for cold weather. This may be achieved by an on-the-fly translation of text data into other multimedia data format by the help of the template. Other types of conversions are also possible. Further, an appliance that plays downloaded MIDI data for music presentations may have a template which accesses only the video or audio content of a page. Other situations may use only text listed on pages and discard or ignore all data relating to borders and links. A template may also include a search function for laundering accessed pages for specific content or types of content, such as video or audio.

Detailed Description Text - DETX (158):

Examples provided thus far are closely associated with the Internet and WEB pages. Internet WEB pages, however, are not the only data sources that may be accessed in embodiments of the present invention. Data stored in remote legacy systems (other than WEB servers) may also be accessed and used. In this aspect a source-side template is provided that translates the retrieved data into HTML format. Then the proxy server in an embodiment of the present invention can use a client-associated template to reduce the files and transmit to the client.

Detailed Description Text - DETX (160):

FIG. 15 is a diagram illustrating operation of a proxy server according to an embodiment of the present invention, with non-WEB page data sources incorporated. A proxy server 1500 operating in a network 1501 according to an embodiment of the present invention accesses data from legacy systems 1530 and 1531 as well as from conventional WEB sources 1520 and 1521. Both legacy systems have a virtual connection to the proxy server, which then converts their input into HTML pages. These may be sent on to normal WEB clients such as PC/Workstation 1510, or to client devices such as wireless UTC (Ultra-Thin-Client) 1502. Of course all other types of clients described above may be involved as well. Also, there is some flexibility as to where and how conversion of legacy source data to HTML content takes place. In some cases it may be done at the legacy source, such as would be the case for a source that desires its data to be available both in the legacy format as WEB-compatible information. In other cases, the conversion can take place at the proxy

server. For example, the proxy server may upload data from a legacy source, store it, and perform an HTML conversion at any time before providing the information to a client according to embodiments of the present invention. The proxy server may also apply any number of templates to the resulting information prior, to transmitting to various clients.

Other Reference Publication - OREF (11):

Gessler, S. et al. "PDAs as Mobile WWW Browsers" Computer Networks and ISDN Systems, vol. 28, No. 1 Elsevier Science BV Dec. 1, 1995 pp. 53-59 XP004001210 ISSN: 0169-7552.

Other Reference Publication - OREF (23):

Todd Courtois and Ray Rischpater, Portal: A PDA-to-World-Wide-Web Interface, PDA Developers, Jan./Feb. 1995, 3.1, Creative Digital Publishing Inc., pp. 1-3.